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A NEW SPECIES OF SINULARIA (COELENTERATA: OCTOCORALLIA) FROM WESTERN AUSTRALIA, WITH EXTRAORDINARY MASSIVE SCLERITES

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ABSTRACT

A new species of soft coral, *Sinularia megalosclera* (Family Alcyoniidae) is described from material collected off Rottnest Island, Western Australia. The species has four types of interior coenchymal sclerites, the most conspicuous being lumpy shapeless masses, mostly less than 5-6mm in diameter, that are recorded to attain a size of 12mm x 5mm x 5mm with a weight of 0.36gm.

KEYWORDS: *Sinularia,* Coelenterata, Octocorallia, Australia.

INTRODUCTION

Although the majority of octocoral genera have species with sclerites less than 1mm in length there are many species with sclerites of larger dimensions. Amongst the Octocorallia loosely referred to as soft corals, the sclerites of *Siphonogorgia macrospiculata* (Thomson and Henderson, 1906), over 8mm long, and those of *Studeriotes longiramus* Kükenthal, 1910, and *Sinularia larsonae* Verseveldt and Alderslade, 1982, up to 10mm long, must rank amongst the largest recorded. The sclerites of the latter two species are spindle shaped, but those of *S. macrospiculata* are more massive being stouter and irregularly shaped. Amongst the octocorals referred to as gorgonians, the sclerites of *Paracis squamata* (Nutting, 1910) were reported to be flat plates up to 5mm x 2mm in size, whilst amongst the sea pens *Pteroeides caledonicum* Kölliker, 1872, can have sclerites between 13mm and 14mm in length (Hickson 1916). There are, however, no reports in the literature of octocorals showing calcification of non-axial sclerite material to the extent displayed by the species described below, where maceration of a portion of the colony leaves a residue resembling white gravel. The nature of the sclerites of the surface layers and the colony morphology also serve to distinguish the species from other members of the genus.

SYSTEMATICS

Sinularia megalosclera sp.nov.

(Figs 1-9)

Type Material. HOLOTYPE - NTM (Northern Territory Museum, Darwin) C1050, Rottnest Island, Western Australia, 32°00'S, 115°30'E, 10m depth, April 1979, K. Harada.

Diagnosis. Encrusting *Sinularia* May, 1898, with a thick spreading base and erect lobes that look somewhat like molar teeth. Sclerites of the surface layer are predominantly clubs of many shapes together with branched forms and small rods. Most of these sclerites are 0.11 - 0.17mm long, but many clubs are larger, up to 0.25mm in the lobes and up to 0.34mm in the surface of the base. Spindles up to 0.5mm also occur in the surface layers. In the interior of the base and the lobes four styles of sclerite occur, the most conspicuous being large lumpy masses up to 12mm x 5mm x 5mm in size, although they are usually less than 5-6mm in diameter. The other interior coenenchymal sclerites are: small, waisted spindles with conical processes, coarsely warted spindles often irregularly branched or stout, and elongate-oval to pear-shaped masses with low evenly distributed warting.

Description. The specimen is a low encrusting piece of the original colony that has been broken into three portions which joined together measure about 165mm x 115mm (Figs 1 and 2). The thickness of the specimen varies from about 10mm to (measured through a lobe) 50mm. The side of the base, which is relatively smooth, slightly undulates over the contours of some large subsurface sclerites and forms a distinct rim around the upper edge of the specimen. The lobes arise vertically from the upper surface and are up to 25mm high. Their summits are divided into several somewhat pointed prominences which give the lobes an appearance

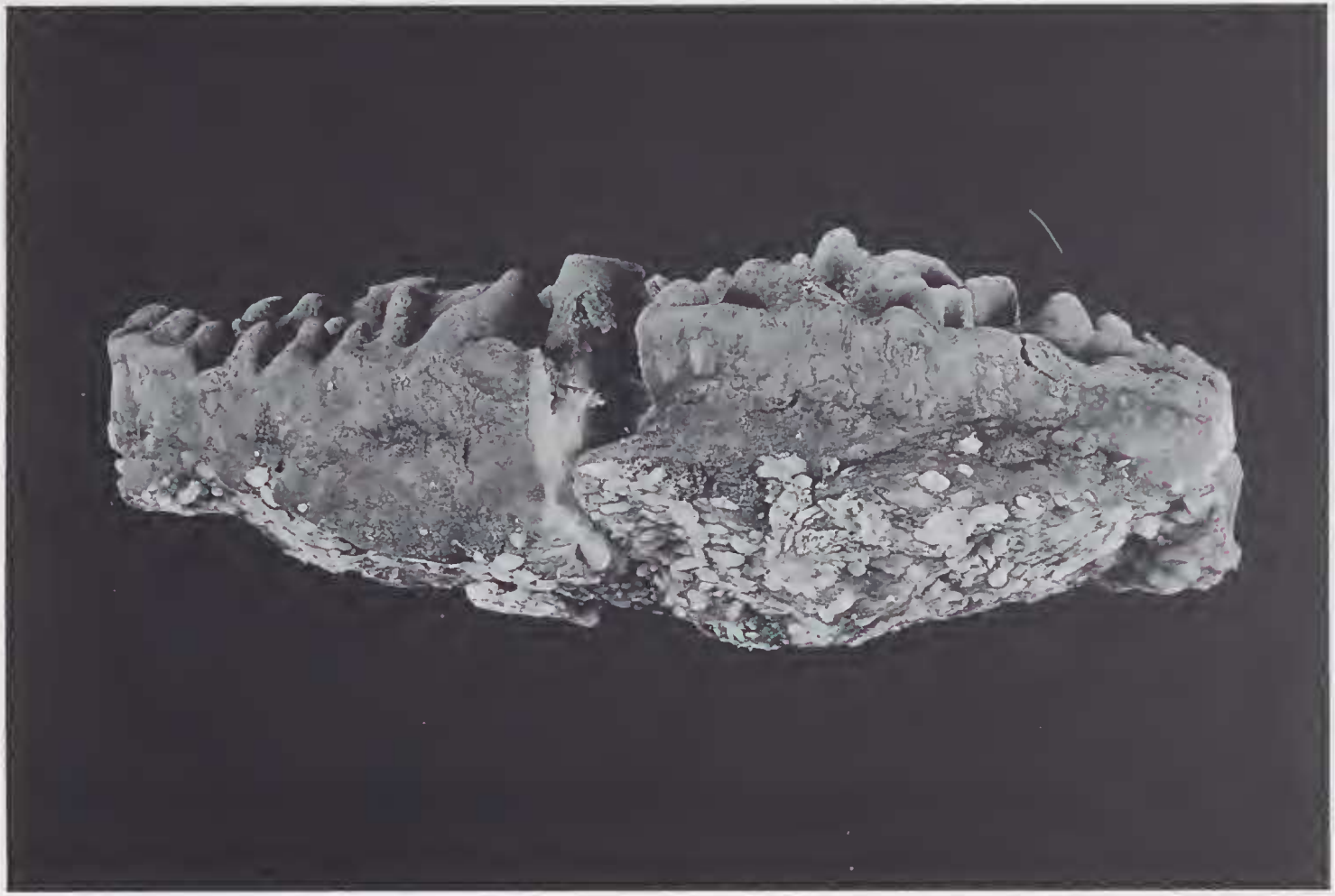

Fig. 1. *Sinularia megalosclera* holotype. Natural size.

Fig. 2. *Sinularia megalosclera* holotype. Natural size.

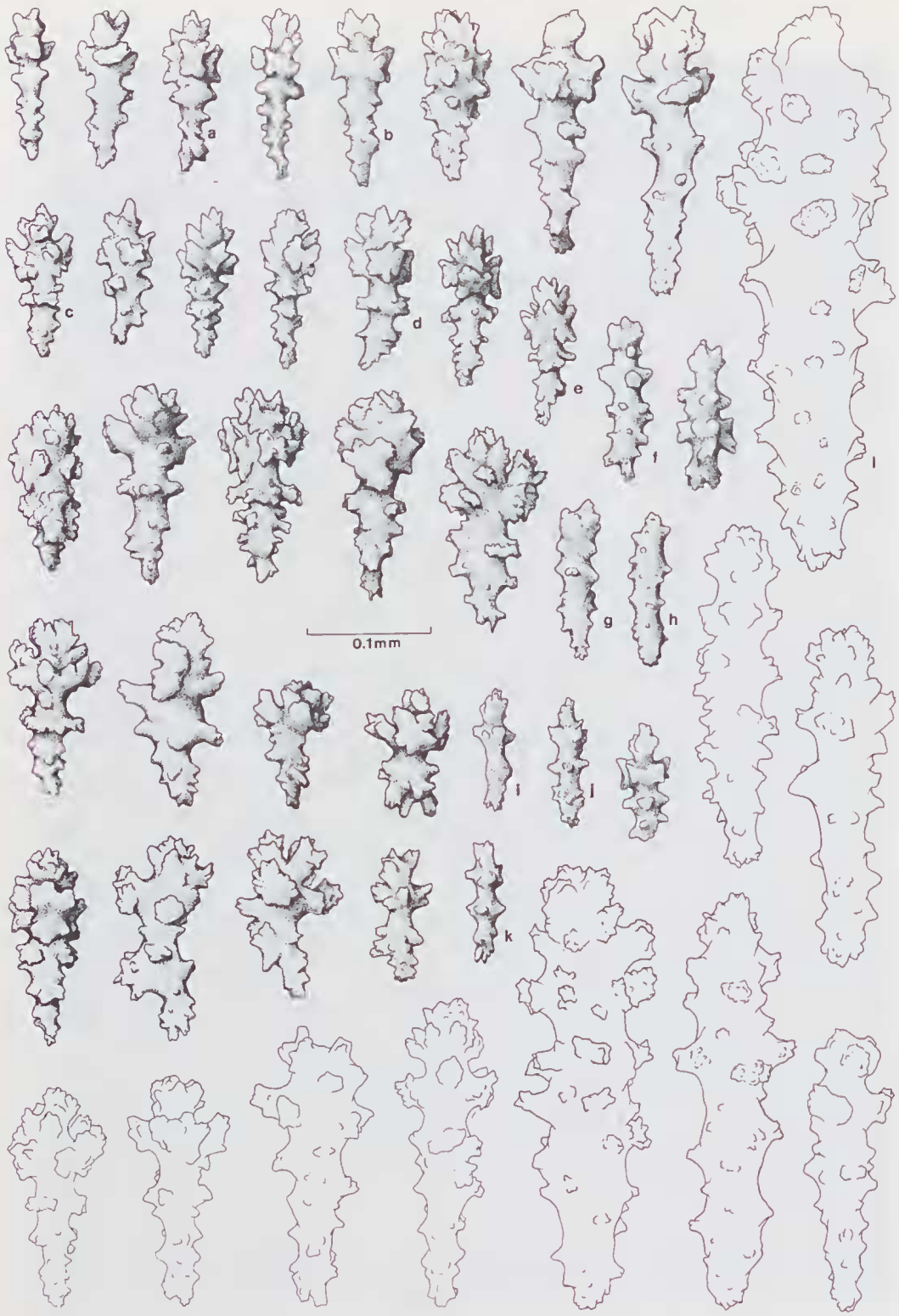

Fig. 3. *Sinularia megalosclera* holotype, sclerites from the surface layer of the lobes.

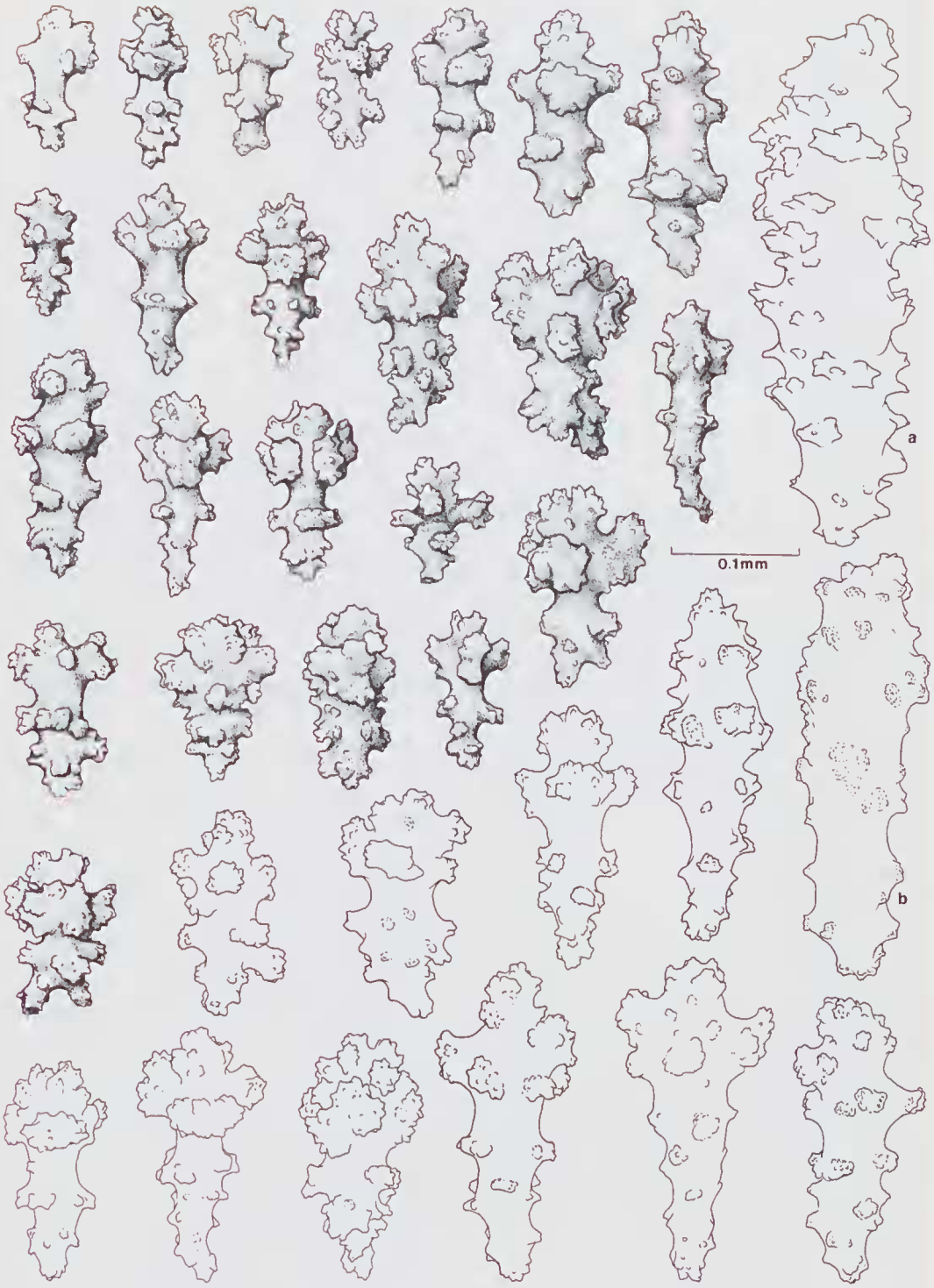

Fig. 4. *Sinularia megalosclera* holotype, sclerites from the surface layer of the the base.

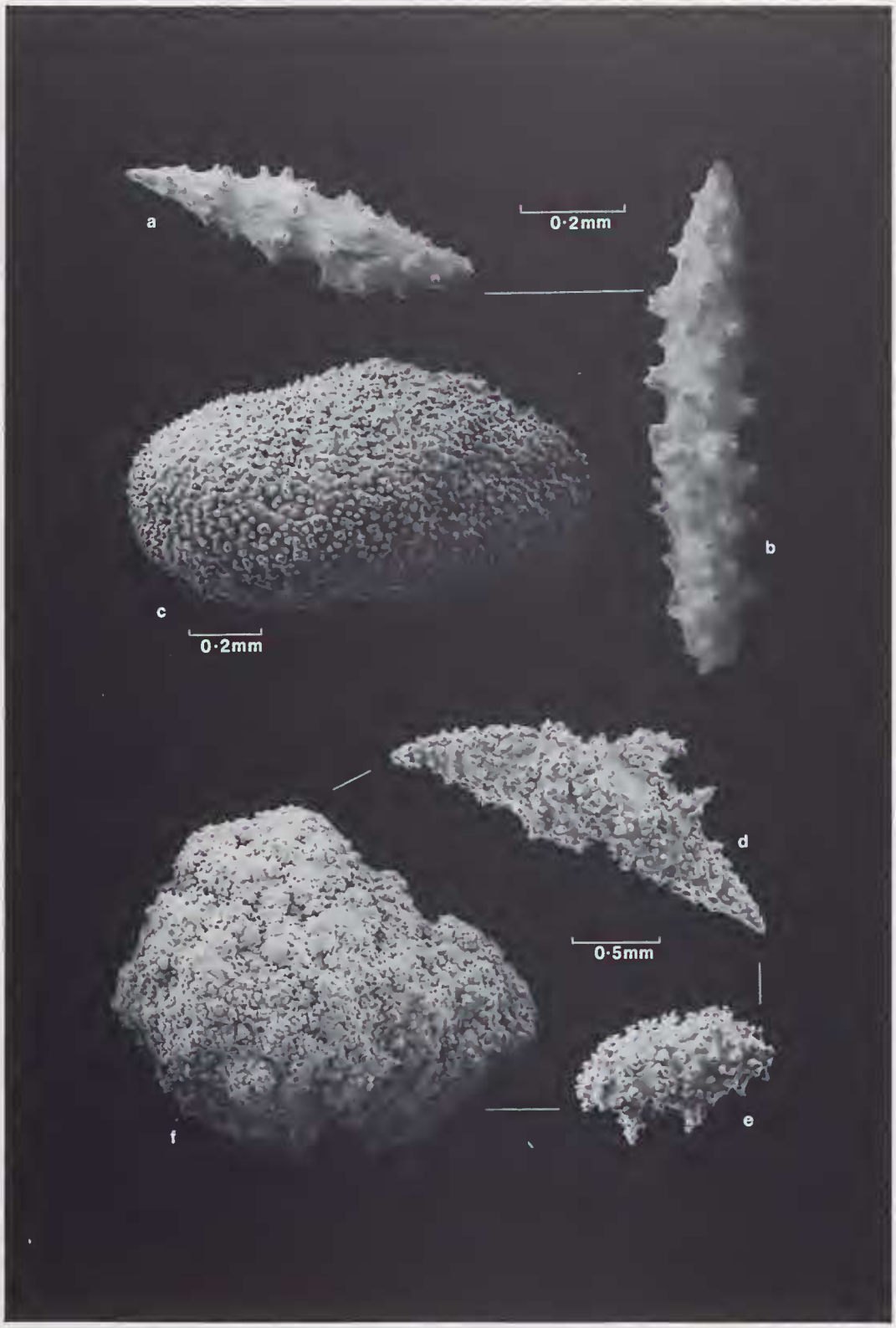

Fig. 5. *Sinularia megalosclera* holotype, interior sclerites.

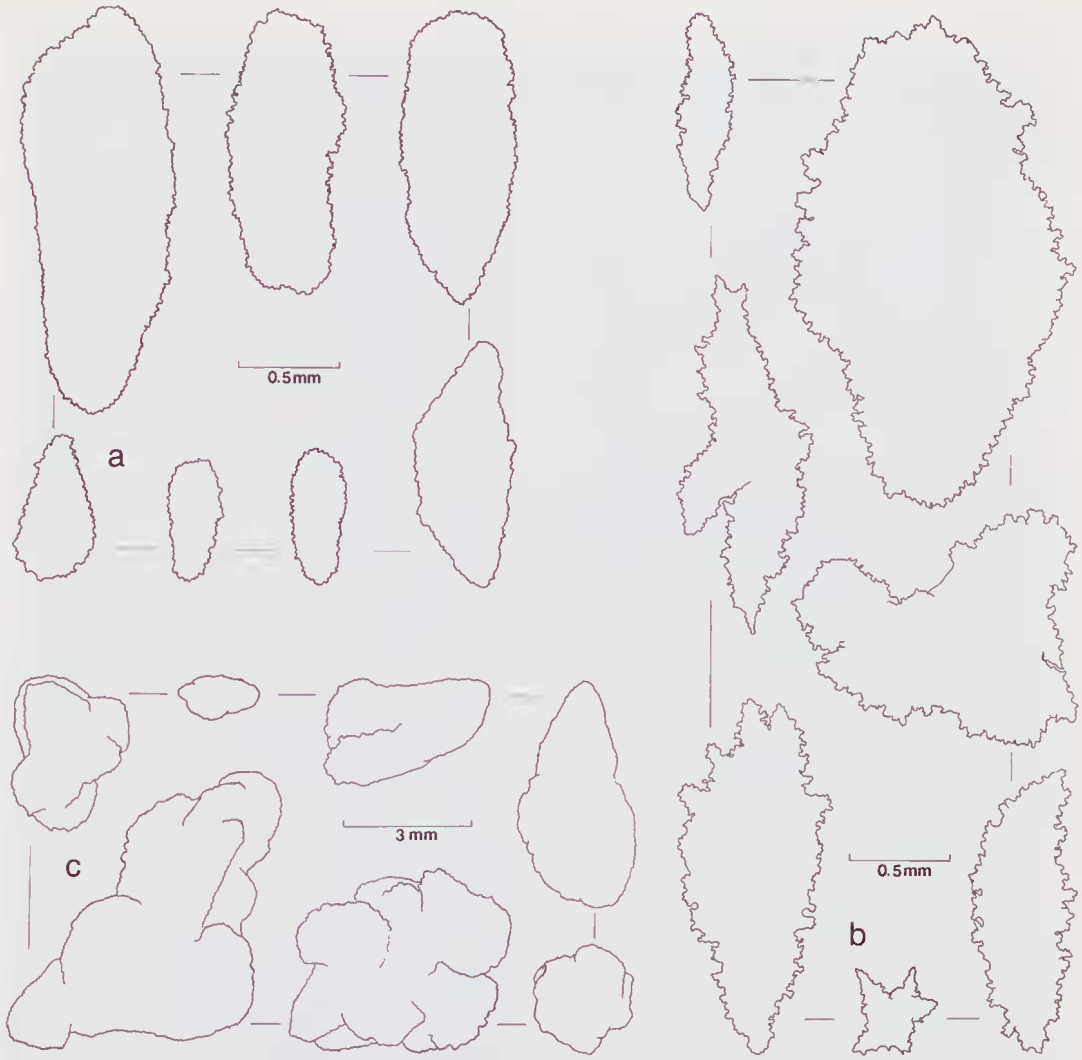

Fig. 6. *Sinularia megalosclera* holotype, interior scleriles.

suggestive of molar teeth. The polyps are all retracted leaving shallow pits 1-2mm apart all over the upper surface.

The sclerites of the surface layer of the lobes are predominantly clubs (Fig. 3). Most have well defined heads and many different types of architecture are present. Perhaps the most characteristic are those with a central wart and whorl of large warts below which tend to appear "wing-like" in plan view (for example, Fig. 3, a-e). There are also many irregularly branched sclerites and some small rod-like forms. Some of the rods are polyp sclerites (Fig. 3, f-k). Most of the clubs are 0.11 - 0.17mm in length but there are many larger clubs up to 0.25mm long. There are also some sclerites, to about 0.5mm long, that approach spindle form and which grade into the interior sclerites (Fig. 3, l).

The sclerites of the surface layer of the sides of the base are also mostly clubs (Fig. 4). There are many different types present, including branched forms, and most are stouter than those found in the lobes. The majority of clubs are 0.11 - 0.17mm in length, but many larger forms occur, occasionally up to 0.34mm long. There are also some sclerites which are spindle-like, up to 0.5mm long, and similar to those found in the surface of the lobes (Fig. 4, a, b).

The sclerites of the interior of the lobes and the base are the same, and are of basically four types: 1, pointed spindles with cone-like prominences and commonly a distinct waist, up to about 1mm in length (Fig. 5,a,b); 2, sclerites with complex irregular warting, that may be spindle-like, stout, or irregularly branched, up to 3.5mm x 1.7mm (Fig. 5,d,e and Fig. 6b); 3, sclerites with finer warting that is relatively evenly distributed, commonly elongate - oval to pear shaped and from 0.5mm x 0.3mm to (rarely) 3.7mm to 1.6mm (Fig. 5,c and Fig. 6a); 4, extremely conspicuous lumpy shapeless masses with low dense warting, usually 1-6mm through the longest diameter but occurring at least to 12mm (Fig. 5,f and Fig. 6c). In Fig. 8, to the right of upper centre, a large sclerite can seen in the colonial coenenchyme. When that sclerite was removed it was found to measure 12mm x 5mm x 5mm and weighed 0.36gm when chemically cleaned. There may be larger ones within the colony. Occasionally sclerites are found that are intermediate between different forms, and some occur that possess fine warting on one side/end and coarse high warting on the other. High magnification photographs of the warting on the sclerites shown in Fig. 5,c,d,f, are shown in Fig. 7A,B,C, respectively.

Some polyps dissected out of the coenenchyme were found to be armed with small numbers of rods grouped loosely at the base of each tentacle (Fig. 9). The rods are mostly about 0.13mm long but can vary from 0.07 - 0.21mm.

Remarks. There are a number of species of *Sinularia* with large interior sclerites. In *S. corpulenta* Li, 1982, they may be up to 8.1mm long, and in *S. larsonae* up to 10mm. In both these species the sclerites are spindle shaped. Thick sclerites, up to 7mm in length and sometimes irregularly shaped, are found in *S. foveolata* Verseveldt, 1974, and *S. brassica* May, 1898. The sclerites in the interior of the stalk of *S. loyai* Verseveldt and Benayahu, 1983, are described as "unbranched, strikingly wide, blunt or pointed", but they are only up to 3.3mm long.

In general, species of *Sinularia* have more than one type of coenenchymal sclerite. Amongst the large "normal" type of spindles there are virtually always small coarsely warted forms, as well as some smoother forms that are most probably developing sclerites. A few species are reported as having the larger coenenchymal sclerites in more than one style; for example, *S. anomala* Verseveldt and Benayahu, 1983, *S. humesi* (see Verseveldt 1971) and *S. peculiaris* Tixier-Durivault, 1970. However, no species of *Sinularia* are reported to have as many distinctly recognisable forms of coenenchymal sclerites as are found in *S. megalosclera*.

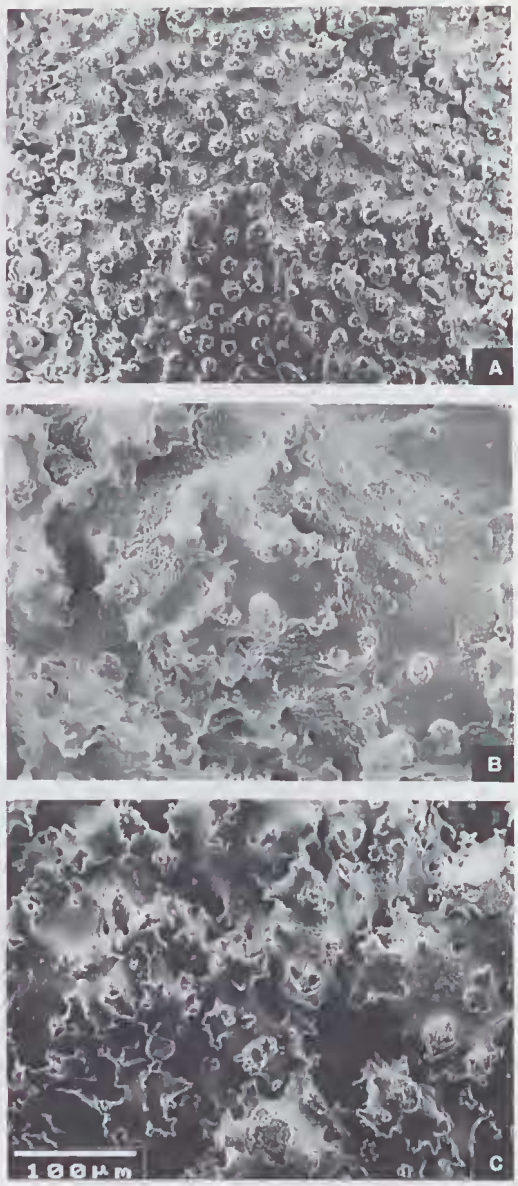

Fig. 7. *Sinularia megalosclera* holotype, warting of interior sclerites: **A**, sclerite from Fig. 5,c; **B**, sclerite from Fig. 5,d; **C**, sclerite from Fig. 5,f. All to same scale.

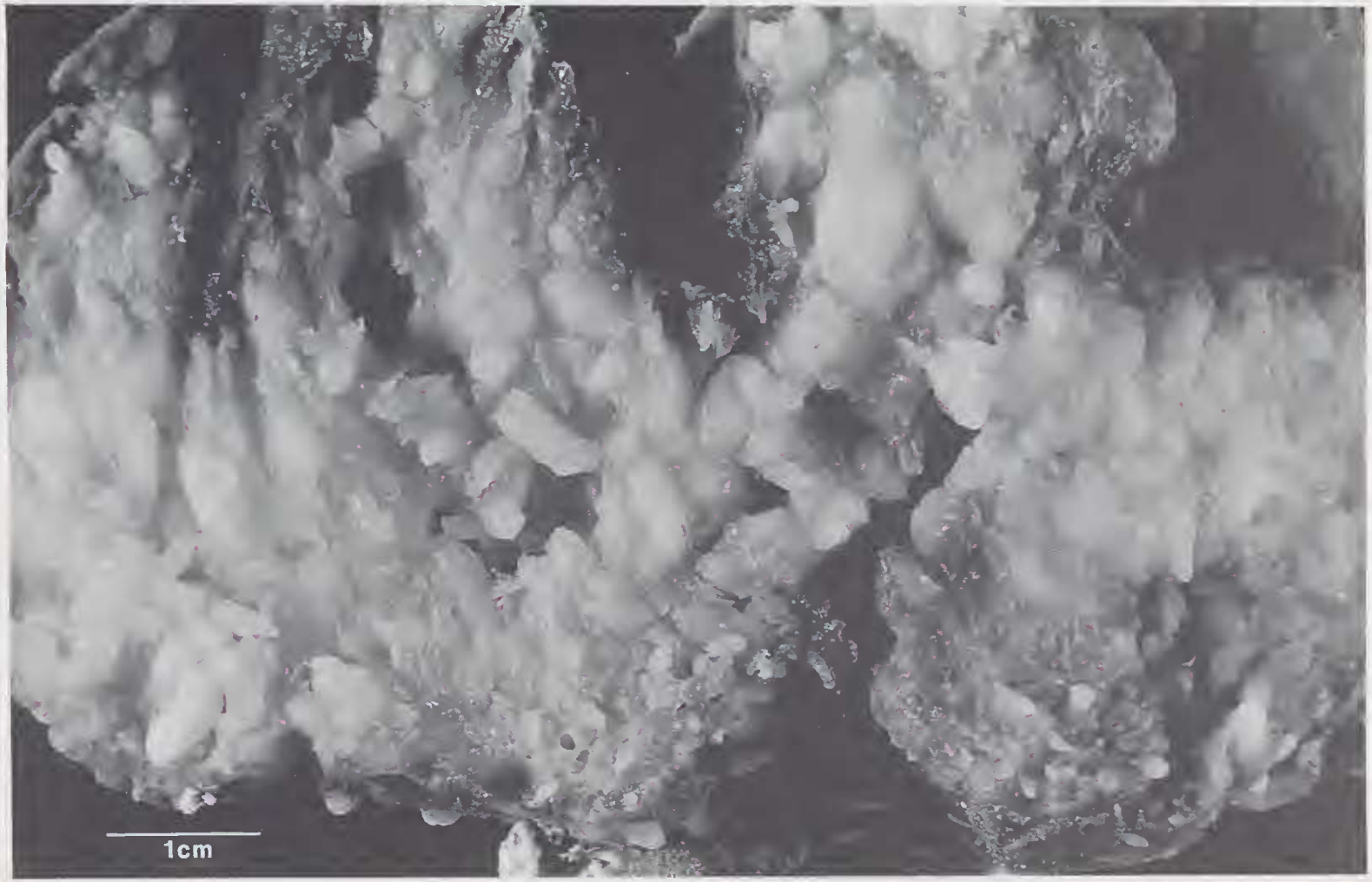

Fig. 8. *Sinularia megalosclera* holotype, cut surface.

Similarly there are no reports in the literature of species with sclerites as massive as those found in the specimen described above.

It is difficult to make comparisons between the surface sclerites of other species of the genus and those of *S. megalosclera* because of the many different forms that are present in this new species. Within a sample of sclerites from the surface layer, clubs characteristic of many different species can be found mixed together. Perhaps the closest species is *S. foveolata* which has clubs of a similar nature to some of those found in *S. megalosclera*. *S. foveolata* also has thick interior coenenchymal sclerites up to 7mm long, but it does not have the same forms of interior sclerites found in*S. megalosclera* nor the same colonial morphology.

Because many of the clubs of the surface layers have a central wart, *S. megalosclera* could be included in Verseveldt's (1980) Group II.

Etymology. The specific epithet makes obvious reference to the massive coenenchymal sclerites found in this species.

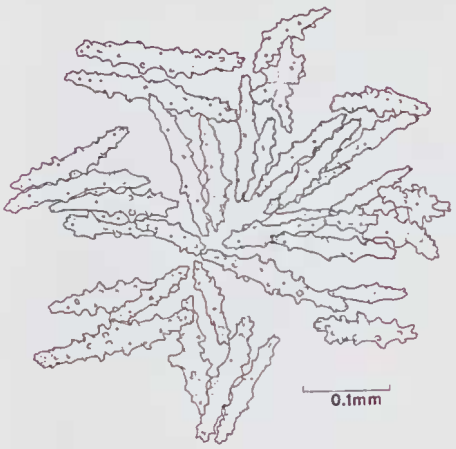

Fig. 9. *Sinularia megalosclera* holotype, polyp armature.

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